

# High Temperature "Smart" P3 Sensors and Electronics for Distributed Engine Control, Phase I

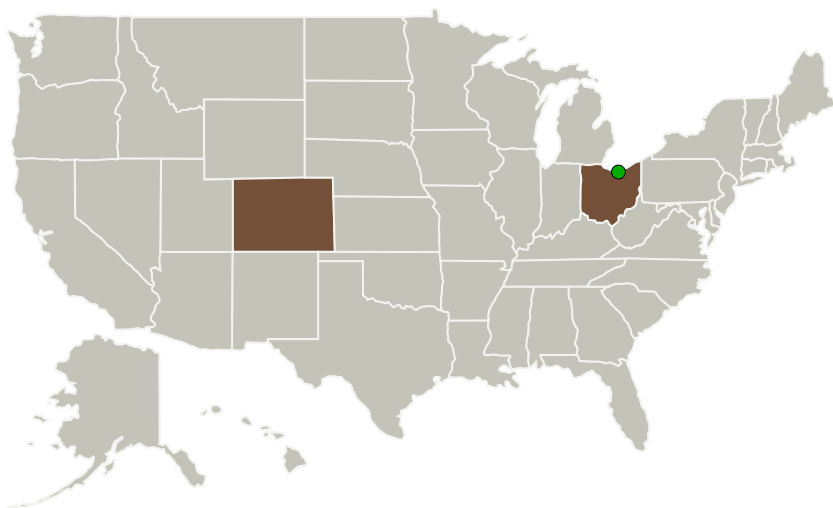
Completed Technology Project (2015 - 2015)



## Project Introduction

Current engine control architectures impose limitations on the insertion of new control capabilities due to weight penalties and reliability issues related to complex wiring harnesses. NASA in collaboration with Air Force Research Lab (AFRL) has been conducting research in developing technologies to enable Distributed Engine Control (DEC) architectures. Realization of such future intelligent engines depends on the development of both hardware and software, including high temperature electronics and sensors to make smart components. NASA is particularly interested in the design and development of these applications for assessing the benefit they bring to the engine system. Compressor discharge pressure measurement has long been a key aspect of turbine engine control to manage stall margin. Given that, there is a need for a high-temperature, smart P3 sensor as a key building block for distributed engine controls. Given the current limitations of high temperature electronics, the business case for smart control elements (sensors and actuators) can be made in the fan/compressor section of the engine. The long-term objective of the proposed effort is to advance high-temperature P3 sensor technology for DEC applications through working with OEM partners and industry working groups to: (1) to iterate the current technology toward DEC formats/functions, (2) advance the digital electronics design/firmware and high temperature electronics, and (3) (through demonstration and stakeholder collaboration) present the viability (technical and business case) of the proposed sensor.

## Primary U.S. Work Locations and Key Partners



High Temperature "Smart" P3 Sensors and Electronics for Distributed Engine Control, Phase I

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Organizations Performing Work	Role	Type	Location
Sporian Microsystems, Inc.	Lead Organization	Industry	Lafayette, Colorado
● Glenn Research Center(GRC)	Supporting Organization	NASA Center	Cleveland, Ohio

## Primary U.S. Work Locations

Colorado	Ohio
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## Project Transitions

**June 2015:** Project Start**December 2015:** Closed out

**Closeout Summary:** High Temperature "Smart" P3 Sensors and Electronics for Distributed Engine Control, Phase I Project Image

**Closeout Documentation:**

- Final Summary Chart Image(<https://techport.nasa.gov/file/138940>)

## Images

**Briefing Chart Image**

High Temperature "Smart" P3 Sensors and Electronics for Distributed Engine Control, Phase I  
(<https://techport.nasa.gov/image/131145>)

## Organizational Responsibility

**Responsible Mission Directorate:**

Space Technology Mission Directorate (STMD)

**Lead Organization:**

Sporian Microsystems, Inc.

**Responsible Program:**

Small Business Innovation Research/Small Business Tech Transfer

## Project Management

**Program Director:**

Jason L Kessler

**Program Manager:**

Carlos Torrez

**Principal Investigator:**

Kevin Harsh

**Co-Investigator:**

Kevin Harsh

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## Technology Maturity (TRL)

Start: **3**  
Current: **4**  
Estimated End: **4**



## Technology Areas

### Primary:

- TX01 Propulsion Systems
  - └ TX01.3 Aero Propulsion
    - └ TX01.3.4 Pressure Gain Combustion

## Target Destinations

The Sun, Earth, The Moon, Mars, Others Inside the Solar System, Outside the Solar System